DT-US015146

PATENT APPLICATION

for

LINTEL BLOCK AND METHOD

Inventors:

Harry R. Layne

Harbert S. Gregory

Assignee:

STEEL BLOCK, Inc.

LINTEL BLOCK AND METHOD

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention generally relates to a lintel block, which is mounted in a block wall. More specifically, the present invention relates to an embeddable lintel block, which is permanently secured or laid within a concrete block or masonry wall during normal construction to provide a strong lintel in a security facility such as a jail, prison, juvenile detention center, psychiatric hospital, etc.

2. Background Information

Many buildings are currently being constructed of concrete blocks or the like to form a masonry block wall. Moreover, certain buildings and public facilities, such as jails, prisons, juvenile detention centers, and psychiatric hospitals, often require the interior walls to be constructed of concrete blocks. To maximize security, these types of facilities have wall constructions that often require the interiors of the blocks to have cement poured into the cavity or cavities of the wall blocks. These wall constructions also often require that the cavities have one or more reinforcing rods extending from the interior of the blocks into the concrete blocks that are above and below.

One recent improvement in concrete block walls has been the use of steel blocks, which is disclosed in U.S. Patent No. 5,649,391, issued to Harry R. Layne, on July 22, 1997. This patent discloses a steel block, which is embedded into the concrete wall. This patent discloses welding the furniture or accessory to the wall. Moreover, this patent also teaches having fasteners formed on the steel block. However, this patent does not teach how to provide lintels in concrete block walls for mounting above openings in the block walls.

Typically, conventional structural beams and concrete masonry units (U-shaped concrete members) filled with concrete and reinforced are laid above openings in block walls to support blocks above the opening, after which steel plates are affixed to the face of the concrete masonry units so that attachments can be welded to the face plate. Openings are often needed in block walls for entries, windows, or other purposes. In many applications, it is necessary to attach devices to the face or underside of lintels, such as sliding prison doors, rollup doors and windows. In these instances concrete masonry block lintels must have steel plate weldments attached to

the face or underside of the concrete masonry units. Typically, when structural beams are used for lintels, the structural beams are cut to the desired length and mounted above the openings. These beams can be difficult to cut. Additionally, when beams are used for lintels, a steel face plate must be welded to the beam so as to provide a flat surface for attachment purposes. These methods are often unattractive and often require special fitting, plastering and/or patching by the mason when installed. These procedures can be difficult and time consuming for the mason, and expensive. Furthermore, it can be difficult to integrate conventional beams into block walls constructed for secure facilities such as jails, prisons, juvenile detention centers, and psychiatric hospitals. In these types of facilities, construction techniques are often utilized to increase the strength of the walls. For example, the cinder blocks of these walls are often filled with cement and vertical reinforcing bars to form a continuous wall structure, as mentioned above. U-shaped concrete masonry units and structural steel beams for lintels in detention areas result in added costs and less desirable prior construction methodology. Concrete masonry is strong in compression but weak in tension. This makes it difficult to attach anything to a lintel made of concrete masonry block units that might be subjected to vibrations due to external forces. Under such circumstances, tension in the concrete masonry blocks is unavoidable and failure a strong possiblity.

It would be a benefit, therefore, to have an embeddable lintel block that could be used in connection with a wall that did not provide a gap between the wall and a mounting surface and that forms an integral part of the wall construction. It would also be desirable to have a method for mounting a lintel block permanently to a concrete block wall that did not require special operations or skills of the mason.

In view of the above, there exists a need for a lintel block which overcomes the above mentioned problems in the prior art. This invention addresses this need in the prior art as well as other needs, which will become apparent to those skilled in the art from this disclosure.

SUMMARY OF THE INVENTION

One object of the present invention is to provide a lintel block that can be easily mounted in a concrete block wall, a masonry wall or a pre-cast concrete wall.

Another object of the present invention is to provide a lintel block that will not require additional plastering or patching of the wall after installation.

A further object of the present invention is to provide a lintel block that is very strong, yet relatively simple and inexpensive to manufacture and assemble, after which, items can be welded or bolted to the face or underside.

Yet another object of the present invention is to provide a lintel block that will fit into the normal confines of the space occupied by standard masonry blocks in either a horizontal position or vertical position to eliminate extra fitting by the mason when the lintel block is installed.

The new lintel block in accordance with the present invention is designed to eliminate some of the problems that have been experienced by the construction industry. The lintel block of the present invention reduces the cost of installation and provides a permanently secure and strong lintel with a relatively simple construction. The lintel block of the present invention allows for relatively simple attachment of devices to the lintel by welding, bolts, etc. Preferably, the lintel block is the size of a plurality of installed full size blocks laid horizontally (end to end) or vertically (side by side as so-called soldier courses) with cementing slurry arranged therebetween. Alternatively, the new lintel block of the present invention has a size that corresponds to two stacked rows of a predetermined number of installed blocks of a block wall. In any event, the size of the lintel block preferably corresponds to the space normally occupied by a predetermined number of installed blocks or one-half blocks of a block wall (with or without cementing slurry arranged therebetween). The predetermined number of blocks defining the size of the lintel will depend on the size of the blocks, the blocking arrangement and the desired size and strength of the lintel.

In accordance with one aspect of the present invention a lintel block is provided that includes a rectangular base member, a first rectangular side member, a second rectangular side member and a plurality of spacer members. The rectangular base member has a first longitudinal side and a second longitudinal side. The first rectangular side member is coupled to the first longitudinal side of the rectangular base member. The second rectangular side member is spaced from the first rectangular side member and is coupled to the second longitudinal side of the rectangular base member. The plurality of spacer members are coupled between the first and second rectangular side members.

In the lintel block of the present invention, the spacer members are preferably configured to form a substantially straight longitudinal passageway arranged between

the first and second longitudinal side members. A reinforcing bar is preferably coupled to the lintel block within the longitudinal passageway. The first and second rectangular side members are preferably fixedly coupled to the first and second longitudinal sides, respectively to form a substantially U-shaped cross-section. The rectangular base member and the first and second rectangular side members are preferably integrally formed together as a one-piece unitary member. Each of the spacers preferably includes a first mounting flange fixedly coupled to the first longitudinal side member and a second mounting flange fixedly coupled to the second longitudinal side member. The lintel block is preferably constructed of metal. Preferably, the lintel block includes at least four spacer members that are fixedly coupled to the first and second rectangular side members by welding. The rectangular base member preferably has a first opening arranged at a first end of the lintel block and a second opening arranged at a second end of the lintel block.

In accordance with another aspect of the present invention, a method of forming a lintel in a block wall is provided that includes the steps of constructing the block wall with an opening using a plurality of construction blocks coupled together by a cementing slurry, and installing and securing a modular lintel block into the block wall above the opening with the cementing slurry. The modular lintel block has a height and width substantially equal to a corresponding height and width of the construction blocks, and a length larger than a corresponding length of one of the construction blocks. The modular lintel block basically includes a rectangular base member, a first rectangular side member, a second rectangular side member and a plurality of spacer members. The rectangular base member has a first longitudinal side and a second longitudinal side. The first rectangular side member is coupled to the first longitudinal side of the rectangular base member. The second rectangular side member is spaced from the first rectangular side member and is coupled to the second longitudinal side of the rectangular base member. The plurality of spacer members are coupled between the first and second rectangular side members.

In the method of the present invention, the length of the modular lintel block is preferably substantially equal to a predetermined integer multiple of one-half lengths of the construction blocks. The spacer members are preferably configured to form a substantially straight longitudinal passageway arranged between the first and second longitudinal side members. A lintel reinforcing bar is optionally coupled to the

modular lintel block within the longitudinal passageway. The rectangular base member preferably has a first opening arranged at a first end of the modular lintel block and a second opening arranged at a second end of the modular lintel block. Preferably, first and second wall reinforcing bars are provided and inserted in the first and second openings of the modular lintel block. The cementing slurring is preferably poured into the modular lintel block. Preferably, the modular lintel block includes at least four spacer members and is constructed of metal.

These and other objects, features, aspects and advantages of the present invention will become apparent to those skilled in the art from the following detailed description, which, taken in conjunction with the annexed drawings, discloses a preferred embodiment of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring now to the attached drawings which form a part of this original disclosure:

Figure 1 is a front perspective view of an embeddable lintel block in accordance with a preferred embodiment of the present invention;

Figure 2 is a top plan view of the lintel block illustrated in Figure 1;

Figure 3 is a side elevational view of the lintel block illustrated in Figures 1 and 2;

Figure 4 is an enlarged end elevational view of the lintel block illustrated in Figures 1-3;

Figure 5 a partial perspective view of the embeddable lintel block illustrated in Figures 1-4 after being partially mounted in a block wall in accordance with the present invention.

Figure 6 a partial perspective view of the embeddable lintel block illustrated in Figures 1-4 after being mounted in a block wall in accordance with the present invention.

Figure 7 is a front perspective view of a modified embeddable lintel block in accordance with another preferred embodiment of the present invention;

Figure 8 is a top plan view of the lintel block illustrated in Figure 7;

Figure 9 is a side elevational view of the lintel block illustrated in Figures 7 and 8;

Figure 10 is an enlarged end elevational view of the lintel block illustrated in Figures 7-9;

Figure 11 is a front perspective view of a modified embeddable lintel block in accordance with yet another preferred embodiment of the present invention;

Figure 12 is a top plan view of the lintel block illustrated in Figure 11;

Figure 13 is a side elevational view of the lintel block illustrated in Figures 11 and 12; and

Figure 14 is an enlarged end elevational view of the lintel block illustrated in Figures 11-13.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring initially to Figures 1-4, an embeddable lintel or lintel block 10 is illustrated in accordance with one embodiment of the present invention. The lintel block 10 basically includes a rectangular base member 12, a pair of generally rectangular side members 14 and 16 and a plurality of spacer members 18. Preferably, these members are all constructed of metal plates fixedly coupled together to form an elongated unitary metal unit. The members 12, 14, 16 and 18 are preferably fixedly coupled together by welding, other conventional metal fastening means and/or constructed together as a unitary member or members, as discussed below. Of course, the lintel block 10 could be constructed of other materials if needed and/or desired.

As seen in Figures 5 and 6, the embeddable lintel block 10 is embedded within a block wall 11 constructed of construction blocks 13 such as cinder blocks, concrete blocks or masonry blocks. The embeddable lintel block 10 is designed to be grouted just like the construction blocks 13 (i.e. cinder blocks, concrete blocks or masonry blocks). Thus, the lintel block 10 fits into the normal confines of the space occupied by a plurality of standard construction blocks in either a horizontal position or vertical position to eliminate extra fitting by the mason as the lintel block 10 is installed.

Referring again to Figures 1-4, the embeddable lintel block 10 is preferably an elongated rectangular modular block that is sized to fit in a space normally occupied by a plurality of the construction blocks 13. More specifically, in the illustrated embodiment, the embeddable lintel block 10 is sized to fit in a space normally occupied by a plurality cinder blocks, concrete blocks or masonry blocks (i.e. utilized as the construction blocks 13 in the illustrated embodiment). As seen in Figure 1, the

embeddable lintel block 10 has a height or width "A", a length "B" and a depth or width "C". The height "A" is preferably between about seven inches and seventeen inches (i.e. between the height of a single standard concrete block and the height of a pair of stacked installed standard concrete blocks) in the illustrated embodiment.

The lintel block 10 could have a height "A" corresponding to the length of an installed standard concrete block (i.e. if standard blocks are positioned vertically, side by side as so-called soldier courses). The length "B" is preferably between about forty-two inches and about eighty inches for a lintel block 10 having a height "A" of a singled standard concrete block. Of course, the length "B" could be longer than eighty inches if needed and/or desired, as long as the lintel block 10 has sufficient strength. For example, in a lintel block 10 longer than eighty inches (i.e. up to about one-hundred-thirteen inches), the height "A" should be increased to the height of a pair of stacked installed standard concrete blocks (about fifteen and five-eighths inches). In any event, the length "B" preferably corresponds to the length of a predetermined number of installed standard concrete (cinder) blocks mounted either vertically or horizontally.

More specifically, in the illustrated embodiment, the lintel block 10 preferably has a height "A" of approximately seven and five-eighths ($7\ ^{5}/_{8}$") inches, a length "B" of approximately sixty-seven (67") inches and a depth "C" of approximately seven and five-eighths ($7\ ^{5}/_{8}$") inches. This size of block 10 allows the block to completely fill the space normally occupied by a row of horizontal cinder blocks, concrete blocks or masonry blocks (installed in a wall). While the embeddable lintel block 10 is illustrated with a single block height (i.e. the height "A" the size of one cinder block), it will be apparent to those skilled in the art from this disclosure that the lintel block 10 can have other sizes as needed and/or desired. For example, lintel block 10 could be constructed to have a height of a double block (i.e. the height "A" the size of two stacked cinder blocks, or a vertical cinder block), or any suitable size as needed and or desired. Of course, the dimensions of the lintel block 10 will depend on the size of the construction blocks used in the wall, the size of the opening and the mortaring procedures used in constructing the wall. The size of the lintel block 10 will also depend on the desired strength of the lintel and the blocking arrangement used in constructing the block wall.

In any event, the lintel block 10 is preferably a modular lintel block that has a

height "A" and width "C" substantially equal to a corresponding height and width of the construction blocks 13 of the block wall 11, and a length "B" larger than a corresponding length of one of the construction blocks 13 of the block wall. The length "B" of the modular lintel block 10 is preferably substantially equal to a predetermined integer multiple of one-half lengths of the construction blocks 13. Thus, the height "A", length "B" and width/depth "C" depend on the type of construction blocks 13 utilized in the block wall 11. In other words, the length "B" of the modular lintel block 10 preferably corresponds to the length of a predetermined number of construction blocks 13 or a predetermined number of blocks 13 plus one-half of one block 13. Moreover, the length "B" can correspond to substantially the exact length of the predetermined number of blocks 13 mounted horizontally or vertically (plus optionally a one-half block), or be slightly longer to account for spacing between the construction blocks 13.

It will be apparent to those skilled in the art from this disclosure that the members 12, 14, 16 and 18 can be constructed as single separate members or of several plates which are fixedly secured together by suitable means such as welding. Moreover, it will be apparent to those skilled in the art from this disclosure that some or all of these plate members 12, 14, 16 and 18 can be constructed from a single plate which is bent to form two or more of the metal plate members. For example, the rectangular base member 12 and the first and second rectangular plate members 14 and 16 can be integrally formed by bending a single metal plate into a U-shaped member, or formed of three separate plates welded together. Thus, it is relatively easy to attach other devices such as doors or windows to the flat surfaces of the lintel block 10 by welding, bolts, etc.

In the illustrated embodiment, the rectangular base member 12 and the first and second rectangular side members 14 and 16 are preferably constructed of one-quarter (¼ ") inch mild steel plates (ASTM A-36) and have thicknesses, which are substantially equal to each other. However, lesser/higher gauges of steel can be used if applicable. The first and second rectangular side members 14 and 16 each have a height "A" of about seven and five-eighths (7 $^{5}/_{8}$") inches and a length "B" of about sixty-seven (67") inches. The depth "C" of block 10 is preferably about seven and five-eighths (7 $^{5}/_{8}$") inches, as mentioned above. Thus, the rectangular base member 12 preferably has a width of approximately seven and five-eighths (7 $^{5}/_{8}$") inches and

a length of about sixty-seven (67") inches.

In the illustrated embodiment, rounded corners are formed between the base member 12 and the first and second side members 14 and 16. In the illustrated embodiment, the base member 12 and first and second side members 14 and 16 are preferably formed by bending a single flat sheet of one-quarter (¼ ") inch mild steel plate (ASTM A-36). Thus, in the illustrated embodiment, the base member 12 and the first and second side members 14 and 16 are preferably integrally formed together as a one-piece, unitary member with a substantially U-shaped cross-section. The rounded corners can be considered part of the base member 12 and/or the side members 14 and 16. In any event, the lintel block 10 preferably has a total height "A" of approximately seven and five-eighths ($7\ ^{5}/_{8}$") inches, a total length "B" of approximately sixty-seven (67") inches and a total depth "C" of approximately seven and five-eighths ($7\ ^{5}/_{8}$") inches. Of course, this is the preferable size when the lintel block 10 is utilized in a wall of standard cinder blocks, concrete blocks or masonry blocks.

The first and second rectangular side members 14 and 16 are preferably metallic planar plate members, which are secured together by the rectangular base member 12 and the spacer members 18 so as to be spaced a predetermined distance apart from each other. The spacer members 18 hold the first and second rectangular metal plate members 14 and 16 substantially parallel to each other and reinforce the lintel block 10. Moreover, in the illustrated embodiment, the spacer members 18 are preferably substantially parallel to each other. Additionally, as seen in Figure 2 (in broken phantom lines), a plurality of two (2") inch pieces of Styrofoam 17 can optionally be arranged adjacent the second side member 16. A plurality of concrete or cement receiving cavities are formed between the first and second rectangular side members 14 and 16 and the spacer members 18. Each spacer member 18 preferably includes a central square cutout 20 to reduce the weight of the spacer members 18 and to allow fluid communication between the cement receiving cavities. Moreover, the spacer members 18 (with the cutouts 20) are configured to form a substantially straight longitudinal passageway arranged between the first and second longitudinal side members 14 and 16.

Of course, it will be apparent to those skilled in the art that the first and second rectangular side members 14 and 16 could be formed separately from the base

member 12 using alternative manufacturing techniques. For example, the base member 12 and the first and second side members 14 and 16 could be formed as flat plates welded together in a conventional manner. Alternatively, the base member 12 and the first and second side members 14 and 16 could be configured to be coupled together by rivets or bolts. In any event, the base member 12 and the first and second side members 14 and 16 should be configured to form a fluid-tight seal for the lintel block 10.

The base member 12 preferably includes a pair of openings 22a and 22b formed therein, with the opening 22a arranged at one end of the of the base member 12 and the other opening 22b arranged at the opposite end of the base member 12. Each of the openings 22a and 22b is preferably a four (4 ") square opening designed to receive a vertical reinforcing bar therethrough, as discussed below in more detail. The openings 22a and 22b are also designed to allow cement to flow downwardly into blocks arranged below. The openings 22a and 22b are preferably spaced about two (2") inches from the respective ends of the lintel block 10. In other words, the lintel block 10 is preferably arranged above an opening O formed in the block wall 11 and is longer than the opening O so that the openings 22a and 22b are at least partially aligned with cement receiving cavities of the blocks of the wall, as discussed below.

The spacer members 18 are preferably constructed from ten gauge mild steel plate (ASTM A-36). The spacer members 18 can have roughly the same height or a smaller height than the first and second rectangular plate members 14 and 16. In the illustrated embodiment, each of the spacer members 18 have a height of about six and five-eighths (6 $^{5}/_{8}$") inches. In other words, the spacer members 18 are preferably about one (1") inch shorter than the height "A" of the lintel block 10. Preferably the top of each spacer 18 is spaced about one-half (½ ") inch from the tops of the first and second side members 14 and 16, while the bottom of each spacer member 18 is spaced about one-quarter (¼ ") inch from the base member 12. Thus, a ¼" rectangular longitudinal passageway is also formed below the spacer members 18 adjacent the base member 12. Of course, the height of the spacer members 18 can vary if needed and/or desired. Thus, it will be apparent to those skilled in the art from this disclosure that a reinforcing bar could optionally be arranged between the spacer members 18 and the base member 12 if needed and/or desired.

Each spacer member 18 preferably includes a base portion 28 with a pair of bent end flanges 30 and 32 extending from opposite sides of the base portion 28. In the illustrated embodiment, the bent end flange 30 or 32 coupled to the first side member 14 will be considered a first mounting flange while the bent end flange 30 or 32 coupled to the second side member 16 will be considered a second mounting flange. The hole or cutout 20 is formed in the base portion 28 of each spacer 18 and is preferably a three and one-half (3 ½") inch centrally located square cutout. Each end flange 30 and 32 is preferably welded to one of the first and second side plates 14 and 16. Each of the spacer members 18 is preferably formed as a one-piece unitary metal member by bending a rectangular plate.

In the illustrated embodiment, the lintel block 10 preferably has seven (7) identical spacer members 18. Preferably, the spacer members 18 are arranged along the entire length of the lintel block 10, with four of the spacer members 18 arranged in a first orientation and three of the spacer members 18 arranged in a second opposite orientation. Specifically, the bent end flanges 30 and 32 of four of the spacer members 18 extend in a first direction, while the bent end flanges 30 and 32 of three of the spacer members 18 extend in a second direction opposite from the first direction, as seen in Figures 1-3. The spacer members 18 arranged at the ends of the lintel block 10 face inwardly so that their base portions 28 are aligned with the ends of the lintel block. Preferably, the spacer members 18 are substantially equally spaced along the length of the lintel block 10. Of course, it will be apparent to those skilled in the art from this disclosure that the lintel block 10 could utilize more/fewer spacers 18 if needed and/or desired. However, preferably, the lintel block 10 has at least four of the spacer members 18.

Of course, it will be apparent to those skilled in the art from this disclosure that each spacer member 18 could be constructed of several pieces or have different structures without departing from the scope of the present invention. For example, each spacer member could be formed of a pair of spacing straps to form an opening therebetween. In any event, the spacer members 18 are configured to form at least one longitudinal axial through passageway for receiving cement and/or a reinforcing bar. In other words, a (horizontal) reinforcing bar can optionally be mounted within the longitudinal passageway formed by the cutouts 20. The reinforcing rod can be welded within the cutouts 20 during fabrication of the lintel block 10 or laid within

the cutouts 20 during installation of the lintel block 10 (and then optionally secured to the lintel block 10). Of course, it will be apparent to those skilled in the art from this disclosure that such a reinforcing bar could be secured to the lintel block 10 utilizing any suitable attachment technique without departing from the scope of the present invention. It will also be apparent to those skilled in the art from this disclosure that the spacers do not have to be identical, if needed and/or desired.

Alternatively, each spacer member 18 can have an additional cutout (not shown in this embodiment) formed therein and arranged at the bottom edge for receiving cement and/or a reinforcing bar as discussed below in reference to another preferred embodiment of the present invention. Additionally, a J-shaped bar support member can optionally be coupled to each spacer, as also discussed below in reference to another preferred embodiment of the present invention. Alternatively, the reinforcing bar can be welded to the spacers, as also discussed below.

Construction of lintel block 10 will now be discussed in more detail. As mentioned above, the rectangular base member 12 and the first and second rectangular side members 14 and 16, and the spacers 18 are preferably bent and welded together, respectively, to be fixedly coupled together in a conventional manner. More specifically, a plate is preferably bent to form the rectangular base member 12 and the first and second rectangular side members 14 and 16. The spacers 18 are preferably welded to the first and second rectangular side members 14 and 16 via the end flanges 30 and 32 in a relatively conventional manner.

Of course, it will be apparent to those skilled in the art that spacer members 18 could have other configurations, and could be fixedly coupled to the first and second rectangular side members 14 and 16 by other conventional mounting methods (such as rivets, bolts, etc), without departing from the scope of the present invention. However, the spacers 18 are preferably welded to the first and second rectangular side members 14 and 16 to create an extremely strong, secure lintel block 10.

Referring again to Figures 5 and 6, a perspective view of a partially constructed concrete block wall 11 is illustrated. Block wall 11 is constructed from a plurality of conventional blocks 13 such as cinder blocks, concrete blocks or masonry blocks. Each of the blocks 13 includes a pair of cement receiving cavities 13a. The lintel block 10 is shown installed between the concrete blocks 13 and above the opening O so that the lintel block 10 becomes an integral part of concrete block wall

11. Additional rows of concrete blocks 13 can then be installed above the lintel block 10 without significantly reducing the strength of the block wall 11.

An exemplary method of forming a lintel in a concrete block wall 11 will now be described. In this exemplary method of permanently attaching and embedding the lintel block 10 into the concrete block wall 11, the method includes the step of installing at least one lintel block 10, as described above, into the concrete block wall 11 in place of a plurality of the blocks 13 during construction of the concrete block wall 11. Installation of lintel block 10 is as follows. First, the cinder, concrete or masonry blocks 13 are laid down to begin construction of the concrete wall. The concrete block wall 11 is constructed with the opening O using a plurality of concrete blocks 13 coupled together by a cementing slurry C. The lintel block 10 is installed and secured into the concrete block wall 11 above the opening O with the cementing slurry C. The term "cementing slurring" as used herein means any suitable paste or attachment material that does not necessarily include concrete as an ingredient.

The cementing slurring C is preferably poured into the lintel block and flows through the openings 22a and 22b into the concrete blocks 13 located below. Preferably, (first and second) vertical wall reinforcing bars R are inserted into the openings 22a and 22b of the lintel block 10. Optionally, a horizontal reinforcing bar similar to reinforcing bar R (not shown in this embodiment) can be arranged in the longitudinal passageway formed by the cutouts 20 of the spacer members 18, as discussed above. Reinforcing bars such as the reinforcing bar R or the optional horizontal reinforcing bar are relatively well known in the art. Thus, the exact size and/or material of the reinforcing bar R will not be discussed and/or illustrated in detail herein. Rather, it will be apparent to those skilled in the art from this disclosure that any suitable size and/or material could be utilized for the reinforcing bar R or the optional horizontal reinforcing bar.

In other words, the lintel block 10 is placed unto the cinder, concrete or masonry blocks 13 of the concrete wall 11 in a desired location of the opening O. The openings 22a and 22b are at least partially aligned with the cement receiving cavities of the cinder, concrete or masonry blocks 13. The vertical reinforcing bars R are placed through the openings 22a and 22b and the cementing slurry mixture C is poured into the lintel block 10. Of course, the block wall 11 can be constructed without reinforcing bars B. However, the reinforcing bars R add extra strength and

security to the block wall 11. In other words, in some applications the cementing slurry C can provide adequate strength and reduced costs. However, the reinforcing bars R are preferred in order to provide an extremely strong, secure block wall 11.

SECOND EMBODIMENT - MODIFIED LINTEL BLOCK

Referring now to Figures 7-10, a modified lintel block 110 is illustrated in accordance with a second preferred embodiment of the present invention. The lintel block 110 is identical to lintel block 10, except that lintel block 110 includes spacers 118 having additional cutouts 121 with a reinforcing bar R' mounted therein. The remaining parts of the spacer members 118 are identical to the first embodiment. All of the spacer members 118 are identical to each other in this embodiment although four of the spacer members 118 are oriented in a first direction while three of the spacer members 118 are oriented in a second direction opposite the first direction. The remaining components or parts of the lintel block 110 are identical to the parts of the lintel block 10 and have the same function of the corresponding components or parts of the lintel block 10. In view of the similarities between this modified lintel block 110 and the lintel block 10, the similar parts of the lintel block 110 will not be discussed and/or illustrated in detail herein. Rather, the following description will focus mainly on the differences. Moreover, the explanations of components or parts and the operations of this second embodiment that are similar to components or parts and the operations of the first embodiment will be omitted.

The lintel block 110 basically includes a rectangular base member 112, a pair of generally rectangular side members 114 and 116 and the plurality of spacer members 118. The members 112, 114 and 116 are identical to the members 12, 14 and 16 of the first embodiment. Moreover, the lintel block 110 is constructed in a manner substantially identical to the first embodiment, except for the additional step of mounting the reinforcing bar R' in the additional cutouts 121 of the modified spacer members 118. Specifically, the reinforcing bar R' is preferably a metal bar that is welded within the cutouts 121 of the spacer members 118 after the members 112, 114, 116 and 118 are bent and coupled together, respectively. The additional cutouts 121 are arranged to be adjacent the base member 112, such that the reinforcing bar R' located in the additional cutouts 121 provides added strength for the lintel block 110. In other words, the spacer members 118 (with the additional cutouts 121) are configured to form an additional substantially straight longitudinal passageway for

receiving the reinforcing bar R'. The lintel block 110 is designed to be mounted in the block wall 11 by the method described in the first embodiment except as modified above.

Of course, it will be apparent to those skilled in the art from this disclosure that the reinforcing bar R' could be constructed of any suitable material and/or size, as needed and/or desired. Moreover, it will be apparent to those skilled in the art from this disclosure that the reinforcing bar R' could be utilized in the longitudinal passageway of the lintel block 10 of the first embodiment.

THIRD EMBODIMENT - MODIFIED LINTEL BLOCK

Referring now to Figures 11-14, a modified lintel block 210 is illustrated in accordance with a third preferred embodiment of the present invention. The lintel block 210 is identical to lintel block 10, except that lintel block 210 includes spacer members 218 that have additional cutouts 221 and support members 223. The remaining parts of the spacer members 218 are identical to the first embodiment. All of the spacer members 218 are identical although four spacer members 218 are oriented in a first direction while three of the spacer members 218 are oriented in a second direction opposite the first direction. A reinforcing bar R" is preferably metal and is mounted in the cutouts 221 and supported by the support members 223. The reinforcing bar R" is not welded to the spacer members 218 within the additional cutouts 221 in this third embodiment. In other words, this embodiment is a modified version of the second embodiment. The remaining components or parts of the lintel block 210 are identical to the parts of the lintel blocks 10 and 110, and have the same function of the corresponding components or parts of the lintel blocks 10 and 110. In view of the similarities between this modified lintel block 210 and the lintel blocks 10 and 110, the similar parts of the lintel block 210 will not be discussed and/or illustrated in detail herein. Rather, the following description will focus mainly on the differences. Moreover, the explanations of components or parts and the operations of this third embodiment that are similar to components or parts and the operations of the first and second embodiments will be omitted.

The lintel block 210 basically includes a rectangular base member 212, a pair of generally rectangular side members 214 and 216 and the plurality of spacer members 218. The members 212, 214 and 216 are identical to the members 12, 14 and 16 of the first embodiment. Moreover, the lintel block 210 is constructed in a

manner substantially identical to the first embodiment, except for the additional steps of fixedly coupling the support members 223 to the spacer members 218 and mounting the reinforcing bar R" in the additional cutouts 221 to be supported on the support members 223. Specifically, the support members 223 are preferably J-shaped metal plate members that are welded to the spacer members 218 prior to coupling the spacer members 218 to the first and second side members 214 and 216. The reinforcing bar R" is then removably mounted on the support members 223 within the additional cutouts 221. The additional cutouts 221 are arranged to be adjacent the base member 212 (i.e. identical to the second embodiment), such that the reinforcing bar R" located in the additional cutouts 221 provides added strength for the lintel block 210. Thus, in this embodiment, the reinforcing bar R" is optional. In other words, the spacer members 218 (with the additional cutouts 221) are configured to form an additional substantially straight longitudinal passageway for optionally receiving the reinforcing bar R". The lintel block 210 is also designed to be mounted in the block wall 11 by the method described in the first embodiment except as modified above.

Of course, it will be apparent to those skilled in the art from this disclosure that the reinforcing bar R" could be constructed of any suitable material and/or size, as needed and/or desired. Moreover, it will be apparent to those skilled in the art from this disclosure that the reinforcing bar R" could be utilized in the longitudinal passageway of the lintel block 10 of the first embodiment.

The terms of degree such as "substantially", "about" and "approximately" as used herein mean a reasonable amount of deviation of the modified term such that the end result is not significantly changed. These terms should be construed as including a deviation of at least ± 5% of the modified term if this deviation would not negate the meaning of the word it modifies.

While only selected embodiments have been chosen to illustrate the present invention, it will be apparent to those skilled in the art from this disclosure that various changes and modifications can be made herein without departing from the scope of the invention as defined in the appended claims. Furthermore, the foregoing description of the embodiments according to the present invention are provided for illustration only, and not for the purpose of limiting the invention as defined by the appended claims and their equivalents.